

Application No. : 09/890,366
Filing Date : July 26, 2001
Amdt. Dated : April 9, 2004
Reply To O.A. Dated : May 9, 2003

REMARKS

The foregoing amendments to the specification and the claims are responsive to the December 11, 2003 Final Office Action in which the Examiner rejects Claims 1 and 2 under 35 U.S.C. § 102(b) as being anticipated by German Publication No. DE 3206178 to Huber et al. In the alternative, the Examiner rejects Claims 1 and 2 under 35 U.S.C. § 103(a) as being obvious over Huber et al. As discussed more fully below, Applicants respectfully traverse the Examiner's rejection under 35 U.S.C. § 102(b) and under 35 U.S.C. § 103(a) in the view of the amendments to Claim 1 and in view of the submission of new Claims 4 and 5.

Discussion of the Amendments

Applicants previously canceled original Claim 3. By the foregoing amendments, Applicants have canceled original Claim 2. In addition, Applicants have amended Claim 1 and have added Claims 4 and 5 to more clearly define the patentable features of the claimed invention.

Response to Rejection of Claims

In amending Claim 1 and presenting new Claims 4 and 5, Applicants have considered the Examiner's response to Applicants' previous arguments filed on November 13, 2003. In particular, Claim 1 is amended herein to more specifically define the step of irradiating the gas-borne aggregates with the laser beam to rapidly increase the temperature of the aggregates so that the aggregates are sintered into non-agglomerate nanoparticles having smaller cross sections to cause the synthesis of non-agglomerate and smaller nanoparticles at higher concentration. Support for the amendments to Claim 1 is found in the specification on page 7 at line 16 through page 8 at line 14, for example.

New Claim 4 further defines the invention defined in Claim 1 as comprising transforming a crystalline phase of nanoparticles into another crystalline phase of

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nanoparticles. Support for Claim 4 can be found in the specification on page 8 at lines 2-14, for example.

New Claim 5 further defines the nanoparticles defined in Claim 1. Support for Claim 5 can be found in original Claim 1, for example.

The irradiating step defined in amended Claim 1 is not disclosed or suggested by Huber et al. In contrast to Applicants' claimed invention, Huber et al. disclose an apparatus and method for manufacturing a dense optical fiber preform without pores by irradiating a laser beam on to the particles "deposited" on the target made by a VAD method. Therefore, Huber et al. do not control the size, shape, phase, and concentration of particles growing in flame. The desired product of Huber et al. is a dense, bulk glass preform of optical fibers in contrast to Applicants' claimed invention, which produces fine particles that have controlled sizes, shapes, and phases.

The role and the location of the laser beam in Applicants' claimed invention is completely different from the role and the location of the laser beam in Huber et al. For example, as defined in Claim 1, the laser beam is irradiated onto aggregates existing in a flame (not on the target) so that the temperature of the aggregates rapidly increases to cause the aggregates to fuse (or coalesce) into spheres having the same volume but smaller collision cross sections than the original aggregates. In this way, the claimed invention slows down the growth of fine particles in the flame, therefore eventually producing much smaller and non-agglomerate nanoparticles at higher concentrations than conventional flame methods for manufacturing fine particles. In contrast to Applicants' claimed invention, Huber et al. teach a method in which fine glass particles formed in a flame are deposited on the target and are sintered with a laser beam simultaneously with the deposition. The laser beam in Huber et al. is irradiated onto the deposited fine particles (on the substrate). In contrast to the laser beam in Huber et al., the laser beam in Applicants' claimed invention is irradiated onto aggregates existing in a flame (that are not deposited on the substrate or target). The role of the laser beam of Huber et al. is to sinter the deposited fine particles into a dense, bulk glass preform.

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In contrast, the role of the laser beam of Applicants' claimed invention is to transform the aggregates into spheres, thereby reducing the collision cross sections of growing particles and producing much smaller, spherical, fine particles at higher concentrations than conventional flame synthesis methods.

In view of the foregoing, Applicants respectfully submit that Claim 1 is patentably distinguished over Huber et al. and the other references of record. Applicants respectfully request the Examiner to withdraw the rejection of Claim 1 under 35 U.S.C. § 102(b) and under 35 U.S.C. § 103(a).

As discussed above, new Claims 4 and 5 depend from Claim 1 and further define the invention defined in Claim 1. In view of the patentability of amended Claim 1, Applicants respectfully submit that new Claims 4 and 5 are patentably distinguished over Huber et al. Applicants respectfully request allowance of new Claims 4 and 5.

Request For Telephone Interview

In view of the foregoing, the present application is believed to be in condition for allowance, and such allowance is respectfully requested. If further issues remain to be resolved, Applicants' undersigned attorney of record hereby formally requests a telephone interview with the Examiner. Applicants respectfully request the Examiner to call the undersigned attorney of record at 949-721-2849 (direct) or at the general office number listed below.

Respectfully submitted,
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